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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/408,972	09/29/1999	MARTIN M. DENEROFF	499.038US1	4705

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SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER

MEONSKE, TONIA L

ART UNIT PAPER NUMBER

2183

DATE MAILED: 11/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/408,972

Applicant(s)

MARTIN M DENEROFF ET AL.

Examiner

Tonia L Meonske

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 03 September 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The proposed drawing correction filed on September 3, 2002 has been disapproved because it is not in the form of a pen-and-ink sketch showing changes in red ink or with the changes otherwise highlighted. See MPEP § 608.02(v).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hamlin et al, U.S. Patent Number 5,434,972.

4. Referring to claim 1, Hamlin has taught a massively parallel processing system comprising:

- a. a plurality of processing element nodes (figure 3, element 11);
- b. a scalable interconnection network (Figures 3 and 22, column 34, lines 3-19)

comprising:

- i. a plurality of physical communication links (Figure 3, Figure 75); and
- ii. a plurality of first level routers for interconnecting the plurality of processing element nodes in a cluster (Figure 3, the first level nodes, or routers, interconnect two processing element nodes, or two computers, in a cluster, Figure

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75, nodes 1 and 5 are first level routers, column 85, line 11-column 86, line 28);
and

iii. one or more metarouters for interconnecting the plurality of first level routers so that each one of the first level routers in a first cluster is connected to all other clusters through one or more metarouters (Figure 3, All of the nodes that are not first level nodes or processing element nodes are metarouters, for example in Figure 75, nodes 2-4 are metarouters, the metarouters interconnect the plurality of first level routers so that each one of the first level routers is connected to all other clusters through one or more metarouters.)

iv. wherein if one of the metarouters is coupled to one of the first level routers, then the one of the metarouters is also coupled to less than two other metarouters (Figure 3, the nodes on the second level are each connected to two of the first level routers, these second level nodes, or metarouters, are each connected to only one other metarouter at a third level, therefore when one of the metarouters is coupled to a first level router, then the one metarouter is also coupled to one other metarouters, which is less than two), otherwise the one of the metarouters is coupled to two metarouters (Figure 3, all of the other meta routers, that are not directly coupled to the first level routers, are coupled to at least two other metarouters.).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamlin et al, U.S. Patent Number 5,434,972 in view of Kumar, "Extended Hypercube: A Hierarchical Interconnection Network of Hypercubes," IEEE 1992.

7. Referring to claim 2, Hamlin has taught the massively parallel processing system, as described above. Hamlin has not specifically taught wherein each one of the clusters is a two-dimensional hypercube. However, Kumar et al. have taught a basic module of an extended hypercube in order to implement highly parallel algorithms. (Figures 1 and 2, page 46, first paragraph) It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the clusters, as taught by Hamlin, with the extended hypercubes as taught by Kumar in order to implement a class of highly parallel algorithms. (Figures 1 and 2, page 46, first paragraph)

8. Referring to claims 3 and 4, Hamlin et al. in combination with Kumar have taught the processing system of claim 1, as described above, but they have not specifically taught that each one of the metarouters are either 4 or 8 port routers. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the metarouters be 4 or 8 port routers. Applicant has not disclosed that having 4 or 8 port routers provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the

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metarouters having any number of ports. Therefore, it would have been obvious to a person of ordinary skill in this art to modify Hamlin to obtain the invention as specified in claims 3 and 4.

9. Referring to claim 5, Hamlin in combination with Kumar have taught the massively parallel processing system, as described above. Hamlin has not taught wherein each one of the processing element nodes comprises four processors. However, Kumar et al. have taught a processing node (Figure 1, node 0) containing four processors (Figure 1, PE 00-07). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the processing nodes, as taught by Hamlin, with the extended hypercube as taught by Kumar (Figure 2) in order to implement a class of highly parallel algorithms (Kumar, page 46, first paragraph).

10. Claims 6 and 7 do not recite limitations above the claimed invention set forth in claims 1-5 and are therefore rejected for the same reasons set forth in the rejection of claims 1-5 above.

11. Referring to claims 8-20, each of the claims merely recites a range of the number of processing nodes that the scalable multiprocessor network connects. As shown in *In re Rose*, 105 USPQ 237 (CCPA 1955) changing the size/range of the prior art is generally not given patentable weight. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the scalable multiprocessor connect any number of processing element nodes, as it has been held that changing the size/range of the prior art is generally not given patentable weight.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as follows. Applicant is reminded that in amending in response to a rejection of

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claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR § 1.111(c).

- a. Goodman, James R. and Sequin, Carlo H., "Hypertree: A Multiprocessor Interconnection Topology," December 1981, IEEE Transactions on Computers, volume C-30, NO. 12.
- b. Efe, Kemal and Ramaier, Kumar, "Congestion and Fault Tolerance of Binary Tree Embeddings on Hypercube," 1991, IEEE.
- c. Fujiwara et al., US Patent 5,471,580
- d. Huang et al., US Patent 6,041,358
- e. Stolfo et al., US Patent 4,860,201
- f. Weaver et al., US Patent 5,263,124

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tonia L Meonske whose telephone number is (703) 305-3993. The examiner can normally be reached on Monday-Friday, 9-6:30, with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie P Chan can be reached on (703) 305-9712. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.


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November 13, 2002


RICHARD L. ELLIS
PRIMARY EXAMINER